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YELLOW FEVER QUARANTINE

OF

THE FUTURE,

BASED UPON

THE PORTABILITY OF ATMOSPHERIC GERMS, AND
THE NON-CONTAGIOUSNESS OF
THE DISEASE.

R. Brown
READ AT THE SEVENTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH
ASSOCIATION, AT NASHVILLE, TENN., NOVEMBER 20, 1879.

BY

HENRY FRASER CAMPBELL, A. M., M. D.,

AUGUSTA, GEORGIA

CHAIRMAN OF THE COMMITTEE ON ENDEMIC, EPIDEMIC, AND CONTAGIOUS DISEASES, IN
THE BOARD OF HEALTH OF THE STATE OF GEORGIA.

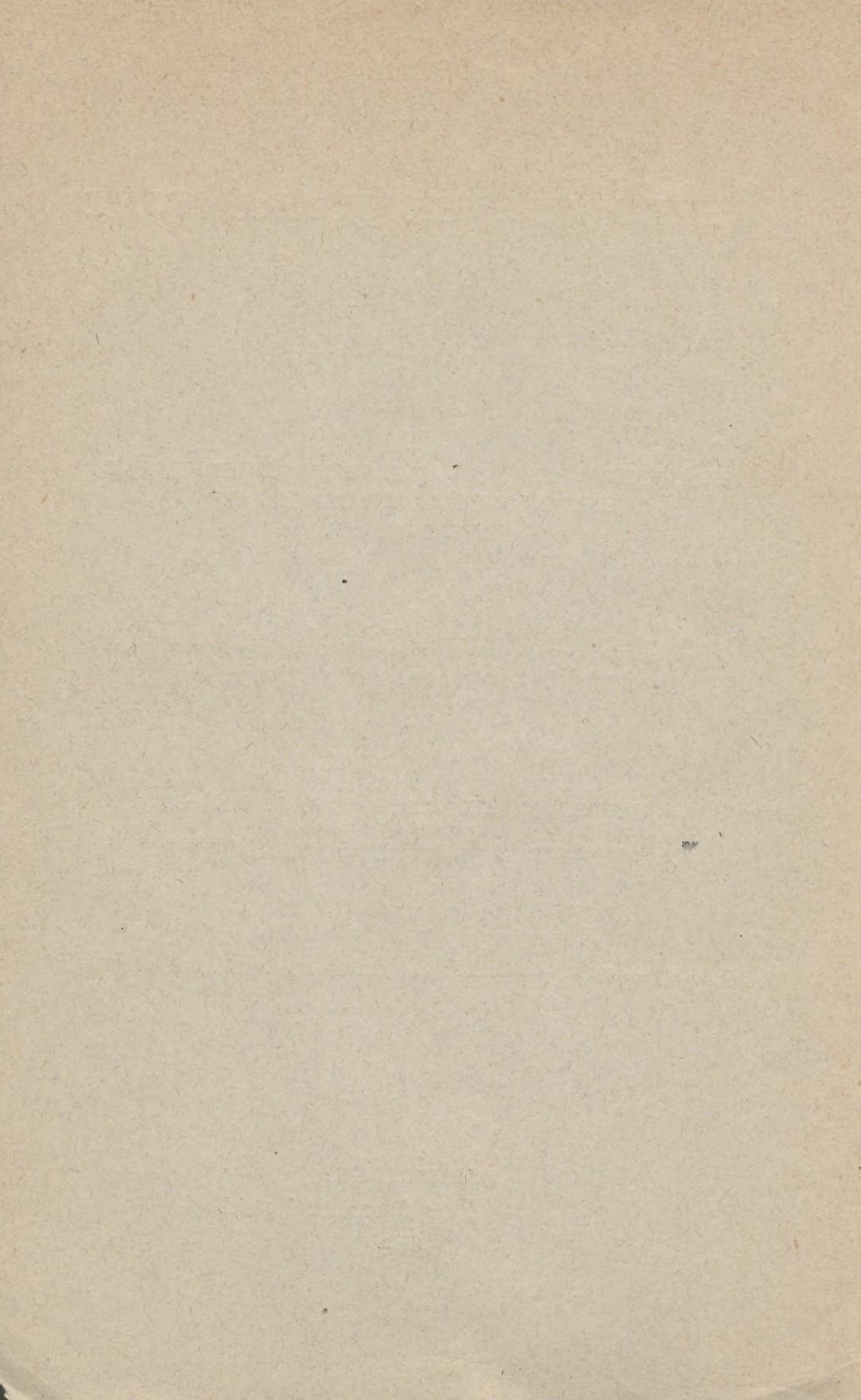
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BY HENRY FRASER CAMPBELL, M. D.,

Of Augusta, Ga.,

*Chairman of the Committee on Endemic, Epidemic, and Contagious Diseases, in the Board
of Health of the State of Georgia.*

MR. PRESIDENT.—The object of the present remarks, as may be inferred from the announcement on our Programme for this evening, is to consider carefully some of the objectionable features of our present system for combatting the extension of yellow fever epidemics, and to suggest such reasonable modifications as, haply, may render practicable as well as efficient our quarantine measures for limiting similar epidemics in the future.

A SKETCH OF INLAND QUARANTINE.

As early as April 9, 1856, after a discussion of the yellow fever epidemics in Charleston, Savannah, Augusta, and Macon, as they prevailed during the season of 1854, the Medical Society of the State of Georgia,¹ then holding its seventh annual meeting in Macon, appointed a committee to report upon the following important subject: "Are there any means by which the extension of yellow fever into the interior may be prevented?"

As the question of "The transportation of yellow fever of 1854 from the coast to the interior by railroads" had been opened by me at that meeting, my name appears as chairman of this committee. The above discussion and specific assignment is, so far as I have been able to find, the first record of a distinct suggestion of the agency of railroads in transporting this disease, and also of the first attention given by sanitarians anywhere to the quarantine of railroads to prevent the spread of yellow fever.²

From the above date to the present time more or less attention has, at long intervals, been bestowed upon the various influences and instrumentalities by which the epidemics of the coast have been propagated inland, and among them railroad communication by freight and travel has at times been recognized as a probable promoter of yellow fever prevalence in

¹ Now known as the Medical Association of Georgia. See *Southern Medical and Surgical Journal*, vol. xii., p. 318, May, 1856.

² If this statement in regard to records on the above subject is erroneous I will most thankfully acknowledge the kindness of a correction.

the interior towns and communities of the South and West. The study of such, and of all influences and relations pertaining to yellow fever, has been, however, naturally and reasonably more or less interrupted by long intervals during the absence of that active interest evoked by the actual or recent presence of epidemics. Most happily, it is only at comparatively distant periods, generally, that the dreaded visitant makes its advent in our seaports, and even less frequently have we suffered from such interior invasions as have of later years become more common, and as have marked its terrible history in 1876, and again in 1878, and yet again in 1879.

The first recognized inland incursion of yellow fever in Georgia, — and I speak of Georgia, because here my observation has been personal, — as is well known, was in 1839. At that time, from Charleston, on the Carolina coast, it found its way to Augusta, one hundred and thirty-six miles distant; and prevailed as a devastating epidemic. Active discussion, and a diligent search into the origin of the disease, as usual, immediately followed; but a perfect immunity of fifteen years, for almost all inland localities, quieted our apprehensions and relaxed our watchfulness concerning an enemy, however formidable, yet so occasional and whilom in its visitations. Not until 1854 are we again called to deplore inland epidemics succeeding to coast incursions of yellow fever. Now, from a repetition of the distresses of 1839, we began to recognize that, under some mysterious and hidden influence, the health and security of distant rural towns were compromised by the existence of yellow fever on the coast. It was the observations made of these epidemics of 1854, and the unmistakable significance of certain occurrences of that season, plainly indicating the agency of railroad transportation in the propagation inland of the terrible scourge, that awakened interest in the subject and caused it to be introduced and discussed in the Georgia Medical Association. Hence resulted the appointment of a committee to propose measures against the inland extension of yellow fever.

Again a period of over twenty years elapses without any striking facts regarding inland transportation of yellow fever. Apprehension, and with it interest, had long since relaxed in regard to protective measures, till the Savannah epidemic of 1876. In this visitation, the tendency to invade interior communities is again recognized with even a clearer interpretation of its significance than ever before. The railroads are now distinctly and unsparely charged as the carriers of yellow fever infection. Since then the wide-spread interest so fully awakened on the subject has been kept up, most unhappily at a frightful cost, — the startling and distressing histories of 1878 and 1879 in the stricken West have fixed for all time our interest in whatever relates to inland quarantine. The full freshness of this interest is now upon us; and, while we are gathered here from every section of our common country to deliberate upon every measure affecting the public health, no one question has more prominence in the minds of all, no one interest appeals more strongly to our hearts, than that which relates to yellow fever. How to keep the Destroyer hereafter from our coasts — how to prevent in the future its spread into the interior? It is with this latter question, as relating to inland quarantine, that I propose more directly to be occupied.

In the present discussion of quarantine measures bearing upon yellow fever, I must state that I am addressing those only who, like myself, hold the two following propositions as accepted and fundamental principles in regard to this disease: —

First. That the poison or product giving rise to the assemblage of phenomena and sequences which are known to constitute yellow fever is an *exotic* readily importable into this country and, after importation, transportable from one region to another.

Secondly. That yellow fever is not in any of its stages communicable from one person to another after the manner or according to the *rationale* of ordinary contagion.

Upon these two comprehensive and fundamental *assumptions*,¹ as they may be styled by some, are predicated and conditioned all the arguments I have to offer and all the suggestions I have to make in the brief period allowed me for these remarks on quarantine. To such of our brethren as deny or disbelieve these propositions, with all due respect for their opinions, I can but say that this discussion is not, in any part, addressed to them. The two platforms on which we severally stand, and the two spheres of thought in which we reason, are so diverse and irreconcilable, that argument — even did we have the time or were this the occasion — would not in the least avail. Unhappily, we cannot “take counsel together.”

I would not here presume to discuss the present question of inland quarantine, except for the belief, that, by an incomparable majority, sanitarians of the largest observation and experience, as well as those most profound in all the science pertaining to the subject, will fully recognize the legitimacy of the grounds from which, as from a common point of departure, our discussion will proceed. In whatever else we may differ, these three tenets we hold in common: The importability of yellow fever from foreign countries; the transportability of yellow fever from one community to another in this country; and, lastly, the non-transmissibility of yellow fever by contagion from one individual to another. Assuming then, as I have said, that these three attributes are almost universally admitted as inherent to the nature of yellow fever, it may not be unprofitable to examine somewhat carefully into the quarantine measures as at present carried out, in order that we may determine to what extent they will be found to be based upon these important and fundamental characteristics of the disease.

Detention of Ships and Cargoes in Quarantine — The Detention of Passengers and Persons with the Ships and their Cargoes.

No one can deny that the system as exemplified in our coast-quarantine for preventing the importation of yellow fever fully recognizes the importability of the disease; nor can any one deny — whatever may have been its failures — that this system is energetically and faithfully carried out, nor can it be questioned that it is most *rational* in all that pertains to the cargo and other contents of the vessel and to the ship-air and to the ship itself.

¹ The points here stated have been already argued in former papers by myself and others.

But who can fail to see that the detention of the passengers on board this infected ship during the "days of observation," however many they may be, is a total ignoring of the admitted fact of non-contagion in which the interests and the rights of these passengers are most *irrationally* compromised. If we hold, as we all do, that the air of the ship, that its cargo and other contents, embody yellow fever poison, capable of infecting all who imbibe it, we rightly and rationally detain such vessel and cargo at a safe distance out of the healthy city and exclude its citizens from coming in near proximity to them to save them from taking the disease. But why detain these passengers after their voyage who have been so long on board, whether they have resisted the influence of the pestiferous air, on the one hand, or have become already affected by it on the other, as shown by symptoms of yellow fever? The answer is well known to us all,—it is an answer that was spoken in a by-gone age,—it is entirely traditional, and, more than that, given to us in the language of an acknowledged and an exploded error: "They are kept under observation from the fear, that having the 'seeds' of the poison, or, if you please, the 'germs' of the disease in their blood, they may develop yellow fever and infect the community of the port and through it the entire country." Let me here ask, Has not the knowledge and science of the present day made here any advance beyond the traditions of the past? Does the answer accord strictly or even loosely with the laws we recognize as governing the propagation of yellow fever in the present day? Do we not deny most positively that personal contagion is one of its attributes in any stage or condition of its development? And yet we could not exercise any more exacting or stringent measures against small-pox, the most contagious of all diseases, than we do at present against yellow fever, to which we totally deny the attribute of personal contagion! Could isolation and exclusion under the direst "casting out" of the leper or the plague, have been more peremptory and complete than that which we now sanction in this advanced age of sanitary science for *non-contagious* yellow fever!

The Quarantine of the Present.—No Refuge or Passport for Persons, though Non-infectious. — No Quarantine for Trains and Freight though filled with Infectious and Propagating Germs.

When we would interrogate, however briefly, the method of quarantine supervision exercised over railroads and other lines of inbound travel and transportation—except in a few rare instances—we must be struck with the still greater inconsistency, indeed the direct contradiction, that practice gives to faith and to principle. Here, in most instances, the person from the infected town, or even *said* to be from any infected locality, though he has no signs of disease upon him, and who, even though he had yellow fever in its most virulent form, could not, according to our widely disseminated opinions, communicate it, I say we exclude such persons, while we have allowed the train of cars filled with the air of infected cities and with porous freight also permeated with such air, to pass in and through, without a challenge!

In our inland quarantine then, it is seen that we violate most palpably, not only one, but two of our three fundamental principles, for we not only

ignore the non-contagiousness of yellow fever and impose on exposed persons a cruel exclusion or a more cruel immuring in an infected locality, subjecting them to a rigor as severe as in the case of small-pox, but we ignore and negative the transportability of the yellow fever germ and allow it to be carried into the healthy city or town by car-loads and trunk-loads. Without reflection, with no deliberate circumspection or comparison, we are blindly guided by the terrible traditions of the past. From the early days when leprosy and plague were the objects against which edicts of isolation were fulminated to the present time, the infected *person* or the subject of the disease has ever been the chief object against which these enactments were directed :—

“‘ Room for the Leper ! Room !’ And as he came
The cry passed on ‘ Room for the Leper ! Room !’

• • • • •
“ Depart ! and come not near
The busy mart, the crowded city, more ;
Nor set thy foot a human threshold o'er ;
And stay thou not to hear
Voices that call thee in the way ; and fly
From all who in the wilderness pass by.

“ Wet not thy burning lip
In streams that to a human dwelling glide ;
Nor rest thee where the covert fountains hide ;
Nor kneel thee down to dip
The water where the pilgrim bends to drink,
By desert well or river's grassy brink ;

“ And pass thou not between
The weary traveler and the cooling breeze ;
And lie not down to sleep beneath the trees
Where human tracks are seen ;
Milk not the goat that browseth on the plain,
Nor pluck the standing corn, or yellow grain.”

There is something touching and humane in the above pronouncement of the terrible Jewish edict by the priest — not so the short and plain-dealing cruelty of times far less remote, and by a people among the highest in the scale of benevolence and enlightenment. Dr. Andrew Fergus, in a late address before the British Medical Association, is said¹ to relate the following as a relic of the past. Its hardness is by no means softened by the hard old Scotch in which it is indited :—

“ In May, 1585, the authorities of Aberdeen built ports to prevent the entrance of people who might bring the infection. Gibbets were erected, ‘ one at the nearest cross, one other at the brig of Dee, and the third at Haven Mouth, that in case any infectit person arrive or repair by sea or land to this brough, or in case ony indweller of this brough receive, house, or harbour, or give meat or drink to the infectit person or persons, *the man to be hangit and the woman to be drownit.*’ ”

Dreadful as may appear to us such enactments and such doings, are not

¹ *North Carolina Medical Journal*, September, 1879, p. 216.

some of us cognizant of a spirit of dread and horror — all unfounded as it was — which pervaded the inhabitants of some of the towns and cities of this country in the recent past in regard to the subjects of yellow fever, and even in regard to refugees from yellow fever districts, though perfectly well? I mean the wild alarm of the populace, and even of authorities of towns, that appeared to justify the suggestion of tearing up railroad tracks, and which, so far as I know, then furnished a new phrase and a ruthless and dreadful idea of modern sanitation, — "Shot-gun quarantine!" — all having their origin in tradition, and in the association of non-contagious yellow fever with contagious small-pox and plague and other personally contagious diseases.

It will be admitted, I suppose, by every one, that the establishment of the system of isolation and exclusion in regard to the subjects of small-pox and the contagious exanthemata, universally observed, has been based upon the scientific indorsement of a common observation of the unmistakable facts in regard to their constant transmission from individual to individual and from one community to another by persons and fomites. Let me now most respectfully ask, does the quarantine which we at present maintain against yellow fever, or tacitly indorse, if we do not establish by sanitary edicts, as Health Officers and Sanitary Commissioners, does this quarantine, I say, accord with our scientific observations and with the conscientious convictions of the majority of the profession, in regard to the capability of its transmission from person to person, or with our *denial* that a case of yellow fever *per se*, — independent of trunks or infected clothing, or other porous goods, — independently of germ-bearing *air*, can originate the disease in any locality healthy or unhealthy, favorable or unfavorable, to its propagation? Practice here certainly violates the convictions of science, if not the intuitions of common sense.

Let us see, when I state my own firm belief in regard to the transmission of yellow fever poison — whether it be "germ," or "spore," or "gaseous emanation," or "dynamic force," — that it is an exotic or imported poison contained largely in the atmosphere of infected places, capable of permeating and remaining in porous, and perhaps solid, substances, converting them into fomites, that this germ-bearing air or these fomites are capable of carrying from place to place, and of communicating the infection to persons, and of infecting the entire atmosphere of communities, I feel quite confident that I enunciate the belief of a majority — of perhaps an incomparable majority — of those who have devoted the largest amount of earnest study to the subject.

And secondly, when I state my conviction, that this atmospheric poison having entered the human blood or system, though producing its characteristic phenomena in the individual imbibing it, is not capable, after the manner of a contagion, of giving rise to similar phenomena in other individuals coming in contact with the subject, nor of infecting the atmosphere of uninvaded communities, I think I may still say that I express the convictions of a very large majority of sanitarians.

The majority holding to the terms of the second proposition may not be

so large or so nearly universal as that holding to the transportability of the yellow fever germ ; but it is a wide-spread conviction, among perhaps the most noted and *influential* sanitarians of the present day, that the inception and propagation of yellow fever is *not by contagion* in any identical or analogous acceptation of the term, as we apply it to small-pox, scarlatina, diphtheria, measles, and other diseases against which we establish the quarantine of isolation and exclusion.

I have used here with emphasis, the term *influential* sanitarians, to indicate the force of the opinions of such scientists in forming and controlling the convictions of the non-professional communities upon which such opinions are to bear in the vital matter of yellow fever quarantine. The people look now trustingly to the rational and consistent decisions of the guardians of the public health and accept them as the fiat of their fate. Let me here ask, Will this proper and wholesome submission to authority long continue under the present inconsonance between theory and practice under which the yellow fever quarantine is at present conducted ? Is our present conduct of this quarantine at all modified by the firm convictions that possess us, or in accordance with the confident and decided opinions we give broadcast to communities ? Have we, in any instance, lightened the burdens or ameliorated the horrors consequent upon the operation of the law, which shuts out from escape and inexorably denies refuge to valuable men, to beloved women, and tender children, who would save themselves by fleeing from the devastating pestilence ? Have we, in a single instance, as yet, allowed humanity, or pity, or consideration, or reason, or even our own firm convictions of the non-contagious character of the disease, to influence us in behalf of the unfortunate inhabitants of the infected city who have not had the prophetic foresight to precipitate departure in time to anticipate the undiscriminating quarantine which suddenly blocks the way to their escape ?

Under the influence of principles which are *not our* principles, one city quarantines against her unfortunate sister city. She may lie directly in the pathway of the life-saving *hegira* of the fleeing community seeking refuge from death, — a *cordon sanitaire*, such as at one time hemmed in the cholera and the plague, forbids their flight ; for not only refuge but even passport through the neighboring towns and cities is denied them. They must remain in or return to their infected homes to breathe again the germ-laden atmosphere, to increase the pestilence, and swell the daily bills of yellow fever mortality.

All this madness is enacted under a superficial and most erroneous interpretation of the opinions of sanitarians, as to the communicability of yellow fever from person to person. Thus did "shot-gun quarantine" find its origin, and upon this same platform has "mob law" more than once come forth to rule the hour !

DEPOPULATION OF THE INFECTED CITIES.

The national and local sanitary authorities counselling with the officers of the Howard Association, at Memphis, wisely proposed, and to a large extent attempted, the thinning of the population, or the depopulation of the

city, as a measure for controlling the epidemic and lessening the mortality. Until personal quarantine has been abandoned, until refugees are no longer recognized as *foci* of contagion, depopulation becomes a dead letter in our efforts to combat yellow fever. Few cities liable to yellow fever are so happily circumstanced that any material depopulation can be accomplished in a reasonable time after the declaring of the epidemic. In most localities invaded by yellow fever no place of safety is to be found sufficiently near at hand, for any considerable *mooty* of the population to take immediate refuge,—the suburbs and even the vicinities for a considerable area are often themselves within the range, and submerged in the germ-laden atmosphere. Few of them are so fortunately situated as Augusta, Ga., where, in the two epidemics of 1839 and 1854, twelve hours did not elapse after the declaration of the epidemic, ere, as we may almost literally assert, the entire white population¹ had removed to a safe distance out of the limits of the infected atmosphere; the sandhills on both sides of the Savannah, the camp ground, and the piny woods affording ready and ample accommodation for all.

For most cities, then, the present personal quarantine, as long as it is recognized, must be an effectual and fatal *bar* to the measure of depopulation. Only in a flight by railroads generally, to localities more or less remote, and in communities alarmed and excited, and *cordoned* and bristling with quarantine prohibitions against every person who can even be *suspected* of having come out of the infected locality, can they possibly seek refuge. Better take the risk of yellow fever in our own homes, with the loving hands of friends to smooth our pillows, or tenderly to close our eyes, than to suffer and perish, outcasts by the wayside, in sight of the inhospitable and garrisoned households of fear-stricken strangers!

Until we establish some system of inland quarantine which, in its carrying out, practically and fully recognizes that which nearly all sanitarians firmly hold to as an established principle, namely, the non-communicability of yellow fever by the infected person to other persons and to communities, we cannot expect anything from the efforts at depopulation. The details of such a system may be difficult,—perhaps expensive and awkward of execution, but I think it probable that a careful consideration of the subject would demonstrate that they are by no means impracticable or at all beyond the reach of a most thorough and effectual accomplishment. The personal inland quarantine, which we at present indorse, and which is conducted under our authority as sanitarians and public health officers, is a complete stultification of our own teachings. It is the quarantine for plague, for small-pox, for cholera, for leprosy, but *not* for yellow fever; we must either change the teaching and declare yellow fever intensely contagious, like small-pox, plague, and scarlatina, or we must modify the quarantine and adjust it to the principles we profess.

If, as we hold, yellow fever is not contagious, who will deny our being able so to systematize our surveillance of all railroads and other avenues of travel, and of persons seeking refuge, in such a manner as to render their entrance

¹ The colored people were little or not at all liable in these epidemics.

and remaining in healthy cities, their being seized there with the disease, being nursed there and dying there, perfectly harmless to other individuals and to the sanitary interests of communities. Centuries of observation and thousands of experiences have fully demonstrated the harmlessness of the infected taking such refuge and enjoying such hospitality and privileges. Time there was, and not a very distant time, when cases of yellow fever were scattered about in every inland city and town and village that could be reached by the flying citizens of the coast. Yellow fever then was dreaded as much as now, but I really believe it was better understood by even the common people than we doctors understand it now. Noon does not seem to have improved upon the early light of dawn. I say the disease was greatly dreaded. Incursions from the coast were looked for in alarm, but no one ever thought then of any refugee or exposed person or imported case producing a second case, much less an epidemic. The announcement of a case of yellow fever would produce always some anxiety, till the one all-important question could be answered: "Did the case *originate* here?" If not, but found to be an "imported case," no more thought or concern was given to the matter. The confident assurance was enjoyed that the poison itself of yellow fever had not yet made its way to our city, but only some one who had imbibed the poison elsewhere, and was suffering from its effects. In no single case was this happy confidence ever disappointed or this logical train of reasoning ever brought in question by an extension of the disease. This single case or others of a like history might be protracted to any extent, or they might die of black vomit surrounded by their friends in the most densely populated parts of the city, and yet no alarm arose among the citizens, no stampeding of families, and entertainment still was accorded to the strangers sick or well.

Looking then into the history of the past, and comparing it with the present tone of public feeling towards refugee cases of yellow fever in healthy inland communities, we cannot fail to discover a most marked and contrasting change. Instead of the welcome and refuge and nursing and tender care extended in the past, all travelers during the season of an epidemic, however distant, have become now by statute — by sanitary statute — objects of suspicion marked for exclusion unless they can purge themselves of the abhorred *taint* of having come out of the infected region, while any one so unfortunate as to be attacked with the disease in his flight had better die by the wayside than be allowed to enter and diffuse poison in the pure atmosphere of a healthy town.

Let me here ask what has given such frightful significance to cases once regarded so innocent and harmless? I will endeavor to give an answer to this question: First among the causes which have produced this change is the fact that yellow fever, at each one of its coast visitations, for more than the past twenty years, has been found to make incursions into the interior and to produce inland epidemics in the same cities where formerly refugee cases had been devoid of evil. The explanation of these incursions have been fully dwelt upon¹ in our former discussions of the transportation of

¹ "The Railroad Transportation of Disease-germs," *Second Report of Board of Health*

disease-germs. It is unnecessary here to discuss the question at length ; to place, however, in a strong light these two conditions of public and professional sentiment will be but presenting in condensed form the entire problem I am attempting to solve. The experimental demonstration necessary to its solution will be seen to have been already made while the precept evolved from it is too plain to be misapprehended and too imperative to be disregarded.

Both the propositions announced in the beginning of the present paper are fully established by this simple comparison : —

First, that the yellow fever refugee, from the coast or elsewhere, traveling slowly, as in times past, by stage or private conveyance, with comparatively little baggage, though he brings with him in his blood a full supply of yellow fever germs or poison sufficient to produce in him all its phenomena, and among them black vomit and death, has never been known, whether he was overtaken by the wayside, in the pine woods, or in the crowded city, to communicate the disease to others, or to infect the air of the inland community in which he had fallen.

While, *secondly*, the yellow fever refugee of the present time, coming in the rapid transit of a few hours by railroad, and bringing with him often the largest Saratoga trunks of porous baggage that had been packed and closed in the infected atmosphere, has brought with him, besides the germs circulating in his own veins, — proved to be innocuous to all but himself, — he has, I say, besides these blood-germs, brought with him a vast multitude of propagating *atmospheric* germs, in all their activity and capacity, to poison all who may directly imbibe them, and to rapidly propagate poison in the atmosphere of the entire locality.

In the first case the ventilation incident to several days of travel had removed from his scanty baggage and wearing apparel, probably, all yellow fever germs that were capable of communicating disease ; only the poison which he carried in his own blood remained, and this could infect no other person nor poison the air. In the case of the modern or railroad traveler, the immense volumes of germ-laden air in the passenger train, and still more in the boxed-up freight cars, besides what is brought in the trunks, must inevitably insure widespread atmospheric infection, and a widespread epidemic. Even though the air of the invaded locality may be what is called "pure," it cannot often escape vitiation ; when it may be what is called "foul," propagation and an epidemic are simply *inevitable*.

OUR FUTURE QUARANTINE.

Let us, then, after anxiously interrogating and rationally interpreting the oracles of the past, implicitly follow the unmistakable precepts we have elicited. Let us so modify our quarantine that the refugee from a region affected with yellow fever, though he carry with him in his blood, as he did formerly, his own fatal dose of disease-germs, shall not bring with him, outside of his own veins, any atmospheric propagating germs. Experience has

of the State of Georgia, 1876, p. 132. Also "The Yellow Fever Germ on Coast and Inland," Transactions of the Medical Association of Georgia, 1879, p. 119.

shown that only these last are capable of producing either an individual case or an epidemic.

Quarantine, in its widest sense as well as in its last analysis, means sanitary dealing with disease-poisons. So long as this dealing is based on rational principles, comprehending and recognizing all the attributes of the particular poisons dealt with, burdensome as they may be, all its mandates and all its measures secure respect and the most implicit obedience; but where, as we have said, practice continues to contradict a widely-acknowledged principle, suspicion, disrespect, and insubordination must everywhere obstruct its intended benefits. The quarantine just now urged recognizes the two prominent and widely-acknowledged principles regarding yellow fever: namely, the extreme transmissibility and receptibility of the atmospheric germ, and the entire absence of contagion in the subject. When these two conditions are fully met such a quarantine can be defended on principle, as I believe it will be vindicated by the happiest result. This is the quarantine which carried out in all its details will be acceptable because reasonable, this, I say, must inevitably become the Yellow Fever Quarantine of the Future.

OUTLINE.

The outline of quarantine measures, such as is here proposed, has been made either directly by myself, or through the discussion and sometimes approval of others,¹ more or less familiar to the members of this Association.

First. Allow no railroad train or car, whether for passengers or freight, coming from an infected locality, to approach within many miles of any healthy or uninfected town or city.

Secondly. Meet these trains, at some undoubtedly safe distance from their place of destination, by fresh cars for both passengers and freight.

Third. A careful and discriminating surveillance to be maintained over the baggage of passengers and over the freight in order to determine what will be *safe*, after ventilation and other means of disinfection, to be taken on the fresh cars. Porous articles and closed trunks being most objectionable till disinfected.

Fourth. That passengers have free passport into, and refuge in, any

¹ See "Report on the Prevention of Yellow Fever in Nashville during the Epidemic of 1878," by J. Berrien Lindsley, R. M. D., Health Officer, *Report No. 3 Board of Health of Nashville, Tennessee*, pp. 290-344. Nashville, 1879.

Also "Report on advances in Hygiene and Public Health," by L. S. Joynes, M. D., Richmond, Va., Secretary of the State Board of Health, etc., *Transactions Medical Society of Virginia — Virginia Medical Monthly*, January, 1878, pp. 201-243.

At a regular meeting of the Augusta Medical Society, held November 13, 1879, the subject of yellow fever being under discussion, the following resolution was unanimously adopted:—

"Resolved: That the yellow fever quarantine of the present time should be so modified as no longer to exclude *persons* coming from infected regions from taking refuge in healthy localities;— baggage, clothing, trunks, and boxes being strictly excluded, and every detail being minutely systematized on this principle."

"A true extract from the Minutes.

(Signed) A. SIBLEY CAMPBELL,
Secretary."

city, town, village, or other community, *without hindrance* on account of their physical condition, in relation to their supposed or manifested inception of yellow fever poison. Long exposure in yellow fever atmosphere, attendance on the sick, actual fever and black vomit should be no bar or hindrance, on account of infection, to the free passage of persons seeking refuge for themselves and families from yellow fever.

Fifth. To secure the privilege and benefits of the unrestricted travel contemplated by the modified quarantine, all persons must submit to such provisions as may be deemed necessary by the sanitary officers. Baths, and change of apparel may be exacted, but simple *ventilation* only will in most cases suffice.

Sixth. In the establishment of a modified quarantine on the above systematized method, arrangements on the most liberal and enlightened scale will be required. Officers of intelligence and high character only should be appointed to superintend and carry out the details of the plan. Whether buildings temporary or permanent will be required, and whether municipal, state, or national sanitary authorities are best to have charge of its conduct, only experience in an untried method can determine. An efficient and easy-working system can only gradually and by slow progress be perfected.

Dr. J. Berrien Lindsley, the distinguished and efficient Health Officer of Nashville, in a valuable and most suggestive report, entitled "Nashville in the Epidemic of 1878,"¹ says, "The multiplied facts of the recent epidemic give the utmost confirmation to Dr. Campbell's views. Under similar circumstances I would unhesitatingly resort to the same rigid quarantine of things as contra-distinguished to persons." Dr. Lindsley, in the same valuable report, makes a most important suggestion bearing upon the railroad transportation of the yellow fever poison of whatever nature it may be: "One important improvement should be added at the very outset of an epidemic. No upholstery should be allowed in passenger cars. They should be furnished with polished wooden seats. Such cars can be readily disinfected."

The sketch just presented is intended to foreshadow in comprehensive outline the more or less complicated details of an inland quarantine for yellow fever, modified and adjusted to the principles we, as sanitarians, hold in regard, first, to the fearfully ready transportability of the infection; and, secondly, to its entire non-contagion. Such being our faith, the merciful boon of free passport and refuge cannot much longer be denied to those who look to us for relief. Our decisions in this case carry with them most truly "the issues to them, of life and death." Even should much complication of machinery, and the expenditure of a considerable amount of the public funds, attend its elaboration and the attainment of its effectual establishment, it will not equal the losses now sustained by the people in the tyrannical interruption of travel, the complete nullifying of commerce proclaimed on account of yellow fever, from the beginning to the end of every epidemic.

¹ *Third Report of the Board of Health for the City of Nashville, for the Two Years ending December 31, 1878*, page 314. Nashville, 1879.

And much less is the expenditure to be considered in comparison with the loss of life, the desolation of homes and of hearts, which every year result from the denial of refuge, the immuring in infected cities among the dying and the dead, and the cruel "casting out" from all places of resort on the slightest suspicion of that *falsest of all assumptions*, yellow fever contagion.

The expenses incident to the carrying out of the present incongruous and absurd quarantine,—entirely irreconcilable with the principles we profess and the doctrines we teach,—no doubt fully equal all that the modified quarantine would cost, after it may have once been accepted and properly organized. The newly gotten-up alarm which now fills every community on the approach of any case of yellow fever will, under the practical demonstration given by the health authorities, soon give place to the common sense and common humanity of former days; while denial of refuge, casting out, and shot-gun quarantine will be remembered with only tears and a blush as frightful frenzies of the past.

As to the simplicity and inexpensiveness of the system now proposed, I almost hesitate to give here an estimate so low as that I have held. The modern developments in regard to disinfection, and the principles enunciated as based upon them, have to a great extent cast into the shade of oblivion a means of purification universally held, until recently, in the strongest confidence and reliance. Freezing, steaming, and the diffusion of atomized chemical *germicides*, have caused us greatly to forget the trust we so long had given to *thorough ventilation in fresh and healthy air* as a disinfectant, not only in the case of germs, but even where the virus of the most contagious diseases was to be combatted. What other disinfectant do we practically now depend upon for the protection of families, when, as physicians, we go from the bedside of scarlatina, of diphtheria, and measles, but the *airing* of our clothes in passing from house to house? And it is known how seldom medical men carry infection in their daily rounds of attendance. This, we can all remember, must have been the great disinfectant which, in the slow-going days of stages and coaches, and private travel, so purified the refugee from all atmospheric propagating germs, allowing only the germs in his blood—*injurious to none others*—to come with him from the coast. May I venture to express my belief? It is this, that exposure of the clothing, and, when practicable, the goods and trunks, on the outside of the cars, or upon platform cars during the rapid passage through the pure air for over twenty miles or more on the railroad, carrying them backward and forward if necessary, would alone, without the aid of *germicides*, sufficiently disinfect these fomites to render them safe and innocuous when carried into a city. My simple plan would be, then, to divest the refugee of the clothes he has worn out of the infected city, and, clothing him in a fresh suit, *lent to him at quarantine*, allow him to go to his destination, even though stricken or dying with yellow fever. Then, after ventilating his own clothes and all that the trunk contained, and the trunk itself, by hanging them from the outside of the train for many miles, to send them promptly after him, with the smallest possible delay.

I have thus, Mr. President and Gentlemen of the American Public Health

16 THE YELLOW FEVER QUARANTINE OF THE FUTURE.

Association, considered, as briefly as I could, the defects, as I regard them, of our inland system of yellow fever quarantine, and have endeavored to answer, not for the first time, the question given me nearly twenty-five years ago : "Are there any means by which the extension of yellow fever into the interior may be prevented?" The answer I have given to this momentous question may be inadequate ; the details of the plan I have outlined are most probably defective in some particulars, whilst they are redundant and impracticable in others ; but in regard to the *Principles* upon which this plan is based, and as to the necessity of recognizing these principles in any system hereafter to be adopted, I am most faithfully and profoundly convinced. Without further elaboration or remark, I can but humbly hope that these principles, so firmly held by us all, will be allowed to underlie our determinations, and consistently to control us in establishing the Yellow Fever Quarantine of the Future.

